United States
Environmental Protection
Agency

Solid Waste and
Emergency Response
(5102W)

EPA 542-R-96-002
March 1996

EPA

Vendor Information Form (VIF) 5.0

To be completed for participation in the

Vendor Information System for Innovative Treatment Technologies (VISITT) Version 5.0

Note: Instead of submitting this form, you may provide information on your technology(ies) electronically. You can obtain the electronic VIF by electronic mail or download it from EPA's CLU-IN bulletin board system. You also can call the VISITT help line to request a 3.5" IBM-compatible diskette. See Section V, page ii for details.

Completion of this form is voluntary. If you have any questions, call the VISITT Help Line at 800/245-4505 or 703/287-8927.

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GENERAL INFORMATION

I. What is VISITT?

Vendor Information System for Innovative Treatment Technologies (VISITT) is a service offered by the U.S. Environmental Protection Agency's (EPA) Technology Innovation Office (TIO) to promote the use of certain categories of innovative technologies for the treatment of contaminated ground water and soil. Version 4.0, which was released in August 1995, contains 325 technologies provided by 204 vendors. The goal of the database is to foster communication between technology vendors and users by providing information on the availability, performance, and cost associated with the application of treatment technologies. VISITT is intended to inform federal, state, and private-sector remediation professionals of their cleanup options and the capabilities of firms to provide innovative remediation services.

II. What Innovative Technologies are Eligible for Inclusion?

Eligible technologies are those that are:

A. Innovative, that is, technologies that lack cost and performance data and are not commonly applied when their use can provide better, more cost-effective performance than conventional methods

B. Designed to treat contaminated soil, sludge, sediments, solid-matrix and to treat groundwater or non-aqueous phase liquids (NAPL) in situ. Technologies that treat groundwater ex situ, incineration, and solidification/stabilization are not eligible.

PARTIAL LIST OF INNOVATIVE TREATMENT TECHNOLOGIES OF INTEREST

Acid Extraction
Adsorption - In Situ
Air Sparging - In Situ Ground Water
Bioremediation - In Situ Ground Water
Bioremediation - In Situ Lagoon
Bioremediation - In Situ Soil
Bioremediation - Not Otherwise Specified
Bioremediation - Slurry Phase
Bioremediation - Solid Phase
Bioventing
Chemical Treatment - Dechlorination
Chemical Treatment - In Situ Ground Water
Chemical Treatment - Other
Chemical Treatment - Oxidation/Reduction
Delivery/Extraction Systems
Dual-Phase Extraction
Electrical Separation
Electro - Thermal Gasification - In Situ
Magnetic Separation
Materials Handling/Physical Separation
Off-Gas Treatment
Pneumatic Fracturing
Pyrolysis
Slagging - Off-Gas Treated
Soil Flushing - In Situ
Soil Vapor Extraction
Soil Washing
Solvent Extraction
Surfactant Enhanced Recovery - In Situ
Thermal Desorption
Thermally Enhanced Recovery - In Situ
Vitrification

Suppliers of separate components of a treatment technology (such as bacteria for bioremediation) will not be listed in the database. EPA will determine whether a technology is eligible for inclusion, if so requested by the vendor. Questions about eligibility of technologies can be directed to the VISITT help line at 800-245-4505 or 703-287-8927. Some of the eligible technologies, as included in VISITT 4.0, are listed on the previous page.

III. Should Confidential Business Information be Submitted?

Submittal of technology information for participation in VISITT is voluntary, and submittals should not include confidential business information. EPA considers information in the database public information, and if so requested, will release all such information. However, if a vendor wishes to provide general information on confidential projects to highlight business experience, the vendor may elect to use generic descriptions (for example, "organic chemical manufacturer").

IV. Submittal of Process Flow Diagram or Schematic

Please provide a flow chart or schematic of the treatment process, showing the equipment necessary for each step. To ensure that schematics are legible in the final system, EPA recommends that schematics be submitted in a Bitmap (BMP), Tag Image File (TIF) or PCX electronic format. If an electronic copy is not available, a camera-ready hard copy suitable for computer scanning can be submitted.

V. Electronic Submittal of Vendor Information Form

Instead of submitting this form, you may provide information on your technology(ies) electronically. To do so, you can download an electronic version of the VISITT Vendor Information Form (VIF) from EPA's Cleanup Information (CLU-IN) Bulletin Board System (BBS) at (301) 589-8366, or you can obtain the VIF by electronic mail (send requests to **cassidt@prcemi.com**). You also can obtain the electronic version on a 3.5" IBM-compatible diskette by calling the VISITT help line at 800-245-4505 (DOS 3.3 or higher is needed to operate the software). For electronic submittals, a diskette containing the completed VIF, along with a hard copy printout of the completed form, should be mailed to the address below.

VI. When and Where to File

Submittal deadline is **June 30, 1996** for inclusion in VISITT 5.0, which is scheduled for release in November 1996. Submittals received after the deadline will be reviewed as time and resources permit.

Send completed VIFs or diskettes to:

System Operator, VISITT
PRC Environmental Management, Inc.
1593 Spring Hill Road, Suite 300
Vienna, VA 22182

Electronic submittals should be compressed and e-mailed to **cassidt@prcemi.com**.

VII. EPA's Authority for Submittal and Burden Statement

EPA's authority for conducting this fifth Invitation for Submittal is set forth under section 311 of the Superfund Amendments and Reauthorization Act of 1986 (42 U.S.C. 9601 *et seq.*). Under section 311, EPA may collect and disseminate information related to the use of innovative treatment technologies for remediation of hazardous waste sites.

EPA estimates that the vendor reporting burden for this collection of information will average 25 hours per respondent for one original submittal, and 13 hours per respondent for an updated submittal. These estimates include the time applicants will require to review and maintain the data needed and to complete and review the VIF. Send comments regarding this estimate of burden, or any other aspect of reducing the burden, to Chief, Information Policy Branch, PM-223, US EPA, 401 M Street, SW, Washington, DC 20460; and to Paperwork Reduction Project (OMB#2050-0114), Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

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VENDOR INFORMATION FORM

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW

1. Date Submitted _____/_____/_____

2a. Developer/Vendor Name_____

2b. Is this an update of a technology listed in VISITT Version 4.0 ? Yes ☐ No ☐

If yes, specify technology and vendor name that appeared in VISITT 4.0 if different from the information in this update.

_____

For VISITT Version 4.0 Vendors: Questions 2c and 2d are intended to gather information on the use of VISITT in the remediation community.

2c. Please provide a rough estimate of the total number or frequency of inquiries your company has received through your inclusion in VISITT. _____

2d. Has your company performed work (either for a fee or free), such as a treatability study, pilot-scale study, or field demonstration, as a result of those inquiries. ☐ Yes ☐ No

Please provide details, if possible. _____

_____

_____

2e. Please list your primary Standard Industrial Classification (SIC) code and check the appropriate business classification for each code. Refer to Appendix A-1 for business classification definitions.

SIC code_____ ☐ Small ☐ Other Than Small ☐ Disadvantaged/Minority ☐ Women-owned

SIC code_____ ☐ Small ☐ Other Than Small ☐ Disadvantaged/Minority ☐ Women-owned

3. Street Address_____

_____

4. City _____ State/Province _____ Zip Code _____

5. Country _____

6. a. Contact Name(s) _____

b. Contact Title(s) _____

7. Contact Phone ( )_____-_____ ext. _____ 8. Fax Number ( )_____-_____

9. E-mail Address _____

10. Home Page Address _____

Vendor Name _____

Technology Type _____

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW *(continued)*

11. **Technology Type.** *Check one only.* Fill out a separate form for each additional technology.

- ☐ Acid Extraction
- ☐ Adsorption - In Situ
- ☐ Air Sparging - In Situ Ground Water
- ☐ Bioremediation - In Situ Ground Water
- ☐ Bioremediation - In Situ Lagoon
- ☐ Bioremediation - In Situ Soil
- ☐ Bioremediation - Not Otherwise Specified
- ☐ Bioremediation - Slurry Phase
- ☐ Bioremediation - Solid Phase
- ☐ Bioventing
- ☐ Chemical Treatment - Dechlorination
- ☐ Chemical Treatment - In Situ Ground Water
- ☐ Chemical Treatment - Other
- ☐ Chemical Treatment - Oxidation/Reduction
- ☐ Delivery/Extraction Systems
- ☐ Dual-Phase Extraction
- ☐ Electrical Separation
- ☐ Electro-Thermal Gasification - In Situ
- ☐ Magnetic Separation
- ☐ Materials Handling/Physical Separation
- ☐ Off-Gas Treatment
- ☐ Pneumatic Fracturing
- ☐ Pyrolysis
- ☐ Slagging - Off-Gas Treated
- ☐ Soil Flushing - In Situ
- ☐ Soil Vapor Extraction
- ☐ Soil Washing
- ☐ Solvent Extraction
- ☐ Surfactant Enhanced Recovery - In Situ
- ☐ Thermal Desorption
- ☐ Thermally Enhanced Recovery - In Situ
- ☐ Vitrification - General
- ☐ Other (specify) _____

_____

12a. **Technology Name Assigned By Vendor** *(if different than name listed in Question 11).*

_____

12b. Registered trademark? ☐ Yes ☐ No

12c. Does the vendor hold an exclusive license? ☐ Yes ☐ No

13. Patents

a. Is technology patented? ☐ Yes ☐ No

b. Is patent pending? ☐ Yes ☐ No

14. **Superfund Innovative Technology Evaluation (SITE) Program.**

a. Is this technology being tested, or has this technology been tested, in EPA SITE **Emerging** Technology Program?

☐ Yes ☐ No

b. Is this technology being tested, or has this technology been tested, in EPA SITE **Demonstration** Program?

☐ Yes ☐ No

Vendor Name _____

Technology Type _____

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW *(continued)*

15. **Description of Technology.** In 300 words or less, describe the treatment process, including scientific principles on which the technology is based; key treatment steps; unique and innovative features; whether full-scale system is/will be batch, continuous, or semicontinuous; and whether the technology is above ground or in situ. *Parts 2 and 3* allow more detail for full- and pilot-scale systems. **Provide a flow chart or schematic of the treatment process, showing the equipment necessary for each step. To ensure the schematics are legible in the final system, EPA recommends that schematics be submitted in a Bitmap (BMP), Tag Image File (TIF) or PCX electronic format. If an electronic copy is not available, a camera-ready hard copy suitable for computer scanning can be submitted as an alternative.**

EXAMPLE

Description of Technology

ABC Corporation has developed an innovative solvent extraction technology (SUPER) that uses Super Chemical as the solvent. Super Chemical is a biodegradable solvent.

The key to success of this process is Super Chemical's property of inverse miscibility; below 65 degrees F, Super Chemical is soluble in water (hydrophilic) and above 65 degrees F, it is insoluble in water (hydrophobic). Therefore, cold Super Chemical can extract water and water-soluble compounds, and warm Super Chemical can extract organic contaminants, such as PCBs, pesticides, PAHs, SVOCs, and VOCs.

Within the unit, the soil is washed continuously with Super Chemical in a counter-current process. The contaminants dissolve in the solution and are removed from the soil by the counter-current flow. The contaminated solvents are reclaimed in a closed-loop circuit, eliminating the need for large volumes of solvent. The clean, washed soil is moved to a closed-loop dryer system, where any excess solvent is removed from the soil. When the soil exits the system, it is relatively free of organics and dry. The collected contaminant from the solvent washing is concentrated 1,000 to 10,000 times, reducing its volume and its associated disposal costs, and is pumped periodically from the system into labeled 55-gallon drums for conventional off-site disposal.

Emissions of organic vapors to air are controlled and treated by a carbon absorption system.

Vendor Name _____

Technology Type _____

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW *(continued)*

15. **Description of Technology** *(continued).*

Vendor Name _____

Technology Type _____

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW *(continued)*

16. **Technology Highlights.** In 200 words or less, describe the technology in terms of contaminants treated, performance, implementation, or cost. Include the key marketable features of the technology, such as treatment niche and advantages over other technologies.

EXAMPLE

Technology Highlights

The SUPER solvent extraction process can treat soils, sludges, and sediments contaminated with PCBs, carcinogenic PAHs, pesticides, and VOCs at 20% to 40% of incineration costs. Treated products from the SUPER process include: water suitable for discharge, oil for recycle as fuel, and solids that can be returned to the site as backfill. The process also can reduce the initial volume of contaminated material by as much as 90%.

The SUPER solvent extraction process operates at near ambient pressures and temperatures, uses off-the-shelf process equipment, and controls air emissions. The extraction efficiency (organic removal efficiency) achieved is as high as 99%.

Solvent recovery is also greater than 99%. The process can treat up to 300 tons per day of contaminated soil. This technology is well accepted by communities because air emissions are minimized.

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW *(continued)*

17. **Technical Limitations.** In 200 words or less, describe the technical limitations such as specific contaminants or contaminant combinations, temperature, moisture content, or chemical properties of the contaminant, that could adversely affect applicability or performance.

EXAMPLE

Technology Limitations

The SUPER process is not applicable for metal-only, (e.g., radioactive) or other inorganic wastes, but its performance is not affected by inorganics at low concentrations. This process may require screening or crushing to 0.25 inch, and other feed preparation operations, depending on the waste. The extraction efficiency of an organic contaminant will depend on its solubility in the solvent. The solvent used is best suited for PCBs and pesticides.

Vendor Name _____

Technology Type _____

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW *(continued)*

18. **Other Comments.** In 200 words or less, provide additional information about the technology, such as its history, status, capabilities, and experience and applicable permits obtained (for example, TSCA or RCRA). Also describe plans for future development of the technology, including diversification of media and/or contaminants treated.

EXAMPLE

Other Comments

The SUPER process has been demonstrated successfully at bench scale, pilot scale, and full scale. A full-scale SUPER unit was used to treat sludges contaminated with PCBs at the BAD Oil Refining Superfund site.

Two pilot-scale units have been built. One was operated under the SITE program to treat soils and sludges contaminated with PCBs.

Bench-scale treatability studies have been conducted on contaminated soils containing petrochemical compounds, pharmaceutical compounds, pesticides, PCBs, and wood preserving wastes containing PAHs.

Vendor Name _____

Technology Type _____

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW *(continued)*

19. **Technology Scale.** *Check only one.* Using the following definitions, indicate the operational status of the technology.

a. ☐ **Full scale.** Available equipment is sized and commercially available for actual site remediation. (If you select full scale, you must fill out *Part 2*).

b. ☐ **Pilot scale.** Available equipment is of sufficient size to verify technology feasibility or establish the design and operating conditions for a full-scale system. However, it is not of the size typically used for a cleanup. (If you select pilot scale, you must fill out *Part 3*).

c. ☐ **Bench scale or emerging.** Technology has been shown to be feasible through the use of bench-top equipment in the laboratory. Data from these studies cannot be used to scale up the technology to full scale.

20. **Media treated.** Check "actual" for all media that have been treated by your technology. Check "potential" for all media to which the technology may be applied in the future.

Actual	Potential	
☐	☐	Soil (in situ)
☐	☐	Soil (ex situ)
☐	☐	Sludge (does not include municipal sewage sludge)
☐	☐	Solid (for example, slag)
☐	☐	Natural sediment (in situ)
☐	☐	Natural sediment (ex situ)
☐	☐	Ground water (in situ) [Includes treatment of ground water and/or saturated soil]
☐	☐	Off-gas generated from a primary innovative treatment technology
☐	☐	Dense nonaqueous phase liquids (DNAPL) [in situ]
☐	☐	Light nonaqueous phase liquids (LNAPL) [in situ]

21. **Contaminants and Contaminant Groups Treated.** *Check all that may apply.* Check "actual" for all that have been treated by your technology (that is, data exist). Check "potential" for all that the technology may be applied to in the future. Data for actual contaminants treated should be included in *Part 5* (see Appendix B for key to contaminant groups). If your technology is materials handling/physical separation, delivery/extraction, or if you are an equipment vendor, this question may not apply.

Actual	Potential		Actual	Potential	
☐	☐	Halogenated volatiles	☐	☐	Heavy metals
☐	☐	Halogenated semivolatiles	☐	☐	Nonmetallic toxic elements
☐	☐	Nonhalogenated volatiles	☐	☐	Radioactive metals
☐	☐	Nonhalogenated semivolatiles	☐	☐	Asbestos
☐	☐	Organic pesticides/herbicides	☐	☐	Inorganic cyanides
☐	☐	Dioxins/furans	☐	☐	Inorganic corrosives
☐	☐	PCBs			
☐	☐	Polynuclear aromatics (PNA)			Miscellaneous
☐	☐	Solvents	☐	☐	Explosives/propellants
☐	☐	Benzene-toluene-ethylbenzene-xylene (BTEX)	☐	☐	Organometallic pesticides/herbicides
☐	☐	Acetonitrile (organic cyanide)	☐	☐	Other (specify) _____
☐	☐	Organic acids			_____

Vendor Name _____

Technology Type _____

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW *(continued)*

22. **Industrial Waste Sources or Site Types of Sites Treated.** *Check all that may apply.* Check "actual" for all that have been treated by your technology (that is, data exist). Check "potential" for all that the technology may be applied to in the future. Treatment data should be available for those sites for which "actual" is checked. See Table A for wastes typically associated with each industry.

Actual	Potential	
☐	☐	Agriculture
☐	☐	Battery recycling/disposal
☐	☐	Chloro-alkali manufacturing
☐	☐	Coal gasification
☐	☐	Dry cleaning
☐	☐	Electroplating
☐	☐	Gasoline service station/petroleum storage facility
☐	☐	Herbicide manufacturing/use
☐	☐	Industrial landfills
☐	☐	Inorganic/organic pigments
☐	☐	Machine shops
☐	☐	Metal ore mining and smelting
☐	☐	Municipal landfill

Actual	Potential	
☐	☐	Munitions manufacturing
☐	☐	Paint/ink formulation
☐	☐	Pesticide manufacturing/use
☐	☐	Petroleum refining and reuse
☐	☐	Photographic products
☐	☐	Plastics manufacturing
☐	☐	Pulp and paper industry
☐	☐	Other organic chemical manufacturing
☐	☐	Other inorganic chemical manufacturing
☐	☐	Semiconductor manufacturing
☐	☐	Rubber manufacturing
☐	☐	Wood preserving
☐	☐	Uranium mining
☐	☐	Others *(specify)* _____

_____

_____

23. **Vendor Services.** Check all that apply.

☐ Equipment manufacturer

☐ Subcontractor for cleanup services

☐ Prime contractor for full-service remediation

☐ Other *(specify)* _____

Vendor Name _____

Technology Type _____

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW *(continued)*

Table A

Contaminants/Wastes Associated With Industrial Waste Sources or Types of Sites

1.	Agriculture	:	Pesticides
2.	Battery recycling/disposal	:	Lead (acid)
3.	Chloro-alkali manufacturing	:	Chlorine compounds, mercury
4.	Coal gasification	:	PAHs
5.	Dry cleaning	:	Solvents
6.	Electroplating	:	Chrome, metals
7.	Herbicide manufacturing/use	:	Pesticides
8.	Industrial landfills	:	Wastes from Multiple Sources
9.	Inorganic/organic pigments	:	Solvents, chrome, zinc
10.	Machine shops	:	Metals, oils
11.	Metal ore mining and smelting	:	Metals
12.	Municipal landfills	:	Wastes from multiple sources
13.	Munitions manufacturing	:	Explosives, lead
14.	Paint/ink formulation	:	Solvents, some metals (chrome, zinc)
15.	Pesticide manufacturing/use	:	Pesticides
16.	Petroleum refining and reuse	:	Petroleum, hydrocarbons, BTEX
17.	Photographic products	:	Silver, bromide, solvent
18.	Plastics manufacturing	:	Polymers, phthalates
19.	Pulp and paper industry	:	Chlorinated organics, dioxins
20.	Other organic chemical manufacturing	:	Organics, metals (used as catalyst)
21.	Other inorganic chemical manufacturing	:	Inorganics, metals
22.	Semiconductor manufacturing	:	Degreasing agents (solvents), metals
23.	Rubber manufacturing	:	Rubber, plastics, polymers, organics
24.	Wood preserving	:	Creosote, PCP, arsenic, chrome, PAHs
25.	Uranium mining	:	Uranium, radioactive metals

Vendor Name _____

Technology Type _____

PART 2: FULL-SCALE EQUIPMENT/CAPABILITIES

You must complete this part if you checked Response 17a (that is, technology is at full scale). You also may complete this part if the technology is at pilot scale.

24. **Major Unit Processes.** In 300 words or less, describe the steps and operation of the full-scale system, including list of key components. Also describe any pre- and post-processing required by your technology. Provide more detail than you did in Question 13.

EXAMPLE

Major Unit Processes

Preprocessing

- Front-end loader and weight scale
- Shredder
- Radial stacker belt conveyor and surge hopper

1. Stockpiled soil is transported to a weigh scale by a front-end loader.

2. Soil is deposited directly on a power shredding device. Classified soil with a top size of less than 2 inches passes through the shredder into the feed conveyor.

3. The feed conveyor is an enclosed radial stacker belt conveyor that is 18 inches wide and 60 feet long. The conveyor discharges into the surge hopper located above the thermal processor. The soil is fed into the LT system at regular intervals to maintain the surge hopper seal.

Processing

- Thermal processor
- Induced draft (ID) fan for vapors
- Horizontal screw conveyor and ash conditioner

1. The thermal processor houses four intermeshed screw conveyors. The function of each screw conveyor is to move soil forward through the processor and to thoroughly mix the material, providing indirect contact between the heat transfer fluid and the soil. The shafts and flights of the screw conveyors and the processor jackets are hollow to allow circulation of a heat transfer fluid (that is, hot oil).

2. Vapors are driven off the soil and are drawn out of the thermal processor by an ID fan.

3. Soil is discharged from the thermal processor onto a horizontal screw conveyor and then an ash conditioner.

4. The conditioner is a ribbon flight screw conveyor. Water spray nozzles installed in the conditioner housing cool the discharge material and minimize fugitive dust emissions.

Postprocessing

- Stacker belt conveyor and dump truck

1. The conditioner discharges onto an inclined stacker belt. The stacker belt conveys the wetted processed soil from the conditioner to the dump truck.

PART 2: FULL-SCALE EQUIPMENT/CAPABILITIES *(continued)*

24. **Major Unit Processes** *(continued)*.

Vendor Name _____

Technology Type _____

PART 2: FULL-SCALE EQUIPMENT/CAPABILITIES *(continued)*

25. **Full-Scale Facility** is *(check one only)*

☐ Transportable ☐ Fixed ☐ In situ

b. City _____ and State _____ of fixed facility

26. **Number of Full-Scale Systems.**

_____	Planned/in design	_____	Under construction	_____	Constructed
_____	Projected completion dates	_____	Projected completion dates		

27. **Capacity Range.**

_____ to _____ _____ (units) ☐ Not applicable

28. **Estimated Price Range.** Provide a "ballpark" estimate per unit of waste treated. Include waste preprocessing and exclude excavation, permitting, and disposal of residues.

$_____ to $_____ per _____ (units)

29. **Factors Affecting Unit Price.** With "1" the highest, rank any of the following items that will have a significant effect on the unit price. If the technology is in situ, excavation, and waste handling cannot affect price.

_____	Initial concentration of contaminant	_____	Site preparation
_____	Target concentration of contaminant	_____	Waste handling/preprocessing
		_____	Amount of debris with waste
_____	Quantity of waste	_____	Characteristics of soil (classification,
_____	Depth of contamination		permeability)
_____	Depth to ground water	_____	Utility/fuel rates
_____	Characteristics of residual waste	_____	Labor rates
_____	Moisture content of soil		

_____ Other (specify) _____

30. **Full-Scale Cleanups.**

a. If you are a subcontractor or prime contractor, give the number of full-scale cleanups using your technology that your firm has initiated or completed. Consider only those applications of your technology that were applied at petroleum/hazardous waste sites.

_____

b. If you are an equipment manufacturer, give the number of full-scale cleanups by other firms using your technology of which you are aware. Consider only those applications of your technology that were applied at petroleum/hazardous waste sites.

_____

Vendor Name _____

Technology Type _____

PART 3: PILOT-SCALE EQUIPMENT/CAPABILITIES

You must complete this part if you checked Response Question 17b. You also may complete this part if the technology is at full scale or bench scale.

31. **Major Unit Processes.** In 200 words or less, describe the steps and operation of the pilot-scale treatment system, including a list of the key components. Also describe any pre- and post-processing required by your technology. Provide more detail than you did in Question 13.

EXAMPLE

Major Unit Processes

Pilot-scale testing involves processing the soils or bulk soils through various operations of reduced-size equipment that when set in series, would be similar to a full-scale operation. The equipment consists of:

1. A hopper and screen for feed preparation; removal of tramp material and sizing, if needed.
2. A mixing or attrition tank where the prepared feed is introduced to the liquids. In the most basic system, extraction of contaminant takes place at this stage.
3. A classification circuit, consisting of a sump, pump, and cyclone for separation of coarse sand, gravel, and organics from fine clays and silts.
4. If extraction of contaminant so requires, coarse material is subjected to a specific gravity (SG) separation through use of a vessel, cyclone, or hydrosizer. Contaminated smaller size material (low SG) is separated from the clean, coarse (high SG) material.
5. Clean, coarse material is dewatered with a screen, although in full-scale operation, additional dryers (centrifuges) may be employed.
6. Low SG organics containing contaminant are dewatered with a screen and collected for disposal or secondary treatment.
7. Clays and silts are flocculated in a reaction tank and gravity-concentrated in a thickener or clarifier.
8. Thickened clays and silts containing contaminant are dewatered in a belt press and sent for disposal or secondary processing.
9. Recycled liquid from the thickening and dewatering process is collected and, in some cases, treated before it is returned to the mixing/attrition tank.

Vendor Name _____

Technology Type _____

PART 3: PILOT-SCALE EQUIPMENT/CAPABILITIES *(continued)*

31. **Major Unit Processes** *(continued)*.

32. **Pilot-Scale Facility** is *(Check only one)*

☐ Transportable ☐ Fixed ☐ In Situ

b. City _____ and State _____ of fixed facility.

33. **Number of Pilot-Scale Systems**

_____ Planned/in design _____ Under construction _____ Constructed

34. How many times have you used this technology at your facility or at other locations to conduct pilot-scale studies on actual wastes? Count only once multiple studies pertaining to the same site, regardless of the number of different wastes or tests. Do not count tests on surrogate wastes.

_____

35. Can you conduct pilot-scale treatability studies on some types of waste at your location?

☐ Yes ☐ No At a contaminated site? ☐ Yes ☐ No

36. **Capacity Range.** Prorate capacity of batch processes. This range should be consistent with your answer to Question 35 (the waste requirement for the pilot-scale treatability study).

_____ to _____ _____ (units) ☐ Not applicable

37. **Quantity of Waste Needed for Pilot-Scale Treatability Study.** Give the estimated range of quantity of waste needed to test, at the pilot scale, the feasibility of this technology on a specific waste.

_____ to _____ _____ (units)

Vendor Name _____

Technology Type _____

PART 4: TREATABILITY STUDY CAPABILITIES (BENCH SCALE)

38. Can you conduct bench-scale treatability studies on some types of waste at your location?

☐ Yes ☐ No

39. **Number of Bench-Scale Studies Conducted.** Estimate total number of bench-scale studies conducted on actual waste from different sources or sites. Count only once multiple studies pertaining to the same site, regardless of the number of different wastes or tests. Do not count tests on surrogate wastes.

_____

40. **Description of Bench-Scale Testing Procedures.** In 200 words or less, describe the type of test that would be performed to determine feasibility of this technology for treating a specific waste.

EXAMPLE

Description of Bench-Scale Testing Procedures

In our feasibility assessment tests, we usually start with a sample of the soil to be treated and a knowledge of the nature and of each contaminant concentration and the effluent goals to be met. The following steps then are taken:

a. The optimal conditions for soil washing are studied, such as pH, time, and chelating agent and concentration.

b. Various likely adsorbents are studied on a batch basis to determine which are most effective at removing the metals of interest from the chelating agent in the washing water.

c. One or more selected media then are studied on columns to determine their ability to retain metals in a continuous-flow situation.

d. For the surviving adsorbent(s), the ion elution performance then is determined; after this step, one resin will have been selected as optimal for the particular task under study.

e. The selected adsorbent then is subjected to a number of charge and regeneration cycles to establish its ruggedness.

Vendor Name _____

Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

41. List as many as *five* representative projects that also can serve as references. List information for only one project per sheet. For projects that have more than one application, fill out a separate sheet for each application. Provide only the performance data that is specific to each project listed. Full- and pilot-scale projects are of most importance. EPA reserves the right to add information on projects conducted for the federal government of which EPA is aware.

a.

Site Name or Industry Type if Client Identity is Confidential: _____

Site Type or Waste Source (Check all that apply)

- ____ Agriculture
- ____ Battery recycling/disposal
- ____ Chloro-alkali manufacturing
- ____ Coal gasification
- ____ Dry cleaning
- ____ Electroplating
- ____ Gasoline service station/petroleum storage facility
- ____ Herbicide manufacturing/use
- ____ Industrial landfills
- ____ Inorganic/organic pigments
- ____ Machine shops
- ____ Metal ore mining and smelting
- ____ Municipal Landfill
- ____ Munitions Manufacturing
- ____ Paint/ink formulation
- ____ Pesticide manufacturing/use
- ____ Petroleum refining and reuse
- ____ Photographic products
- ____ Plastics manufacturing
- ____ Pulp and paper industry
- ____ Other organic chemical manufacturing
- ____ Other inorganic chemical manufacturing
- ____ Semiconductor manufacturing
- ____ Rubber manufacturing
- ____ Wood preserving
- ____ Uranium mining
- ____ Others *(specify)* _____

Location

City _____

State/Province: _____

Country _____

Project took place at site named

____ Yes

____ No

At another site (that is, a Test facility)

____ Yes

____ No

Regulation/Statute/Organization (Check all that apply)

- ____ *RCRA corrective action*
- ____ *CERCLA*
- ____ *TSCA*
- ____ *Safe Drinking Water Act*
- ____ *UST corrective action*
- ____ *State (specify)* _____
- ____ *DOD*
- ____ *DOE*
- ____ *Other (Specify)* _____
- ____ *Not Applicable*

Application or Project Type *(Check all that apply)*

- ____ *Full-scale cleanup*
- ____ *Field demonstration*
- ____ *Pilot-scale treatability study*
- ____ *Bench-scale treatability study*
- ____ *RCRA Research, Development, and Demonstration*
- ____ *TSCA National Demonstration*
- ____ *TSCA Research and Development*
- ____ *EPA SITE Demonstration Program*
- ____ *EPA SITE Emerging Technology Program*
- ____ *Research*
- ____ *Other (specify)* _____

Media Treated *(Check all that apply)*

- ____ Soil (in situ)
- ____ Soil (ex situ)
- ____ Sludge
- ____ Solid
- ____ Natural sediment (in situ)
- ____ Natural sediment (ex situ)
- ____ Ground water in situ
- ____ Off-gas from a primary treatment technology
- ____ Dense nonaqueous phase liquids (DNAPL) [in situ]
- ____ Light nonaqueous phase liquids (LNAPL) [in situ]
- ____ Other: _____

Volume/Quantity Treated

_____ _____ (Units)

Area treated (for in situ projects)

_____ _____ (Units)

Depth treated (for in situ projects)

_____ _____ (Units)

Equipment Scale *(Check one only)*

____ Bench

____ Pilot

____ Full

Project Status

Contracted

Month _____ Year _____

In cleanup Yes ____ No ____

Completed

Month _____ Year _____

Vendor Name _____

Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA (continued)

a. (continued)

Note: (1) List one specific contaminant per line. Do not list such entire contaminant groups as VOCs or solvents. TPH, which can be analyzed using a specific test method, can be listed as an individual contaminant.

(2) and (3) Indicate the appropriate units; for concentrations that were non-detect write N.D.; treated concentration should be lower than untreated concentration unless the technology is dewatering or some other volume reduction method. If a concentration range cannot be given, provide an average and note it as such.

(4) Specify the cleanup standard or goal, if known, for the individual contaminant for this project. For example, if the project was part of a Superfund remedial action, the cleanup goal is specified in the record of decision (ROD) for that site.

Performance Data

(1) Contaminant or Pollutant Parameter	(2) Untreated Concentration Range (Min to Max)	(3) Units	(2) Treated Concentration Range (Min to Max)	(3) Units	(4) Cleanup Standard or Goal	(3) Units
(Example) Benzene	50 - 150	mg/kg	25 - 50	mg/kg	50	mg/kg

Comments on Performance Data _____

Cost Information

Estimated or actual total and/or unit cost for this project

$ _____ per _____ (unit)

$ _____ (total)

What items or activities are included in these cost(s) (e.g., mobilization, demobilization, excavation, waste handling)?

_____

_____

_____

Person outside of company familiar with project (optional)

Name _____ Company _____

Address _____

_____

Phone _____

Is Literature Available on this Project? (You may wish to include these citations in *Part 6*)

___ Yes ___ No

Additional project information site conditions, mode of operation, and other pertinent information). _____

_____

_____

_____

Vendor Name _____

Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA (continued)

b.

Site Name or Industry Type if Client Identity is Confidential: _____

Site Type or Waste Source (Check all that apply)

- ____ Agriculture
- ____ Battery recycling/disposal
- ____ Chloro-alkali manufacturing
- ____ Coal gasification
- ____ Dry cleaning
- ____ Electroplating
- ____ Gasoline service station/petroleum storage facility
- ____ Herbicide manufacturing/use
- ____ Industrial landfills
- ____ Inorganic/organic pigments
- ____ Machine shops
- ____ Metal ore mining and smelting
- ____ Municipal Landfill
- ____ Munitions Manufacturing
- ____ Paint/ink formulation
- ____ Pesticide manufacturing/use
- ____ Petroleum refining and reuse
- ____ Photographic products
- ____ Plastics manufacturing
- ____ Pulp and paper industry
- ____ Other organic chemical manufacturing
- ____ Other inorganic chemical manufacturing
- ____ Semiconductor manufacturing
- ____ Rubber manufacturing
- ____ Wood preserving
- ____ Uranium mining
- ____ Others *(specify)* _____

Location

City _____

State/Province: _____

Country _____

Project took place at site named

____ Yes

____ No

At another site (that is, a Test facility)

____ Yes

____ No

Regulation/Statute/Organization (Check all that apply)

- ____ *RCRA corrective action*
- ____ *CERCLA*
- ____ *TSCA*
- ____ *Safe Drinking Water Act*
- ____ *UST corrective action*
- ____ *State (specify)* _____
- ____ *DOD*
- ____ *DOE*
- ____ *Other (Specify)* _____
- ____ *Not Applicable*

Application or Project Type *(Check all that apply)*

- ____ *Full-scale cleanup*
- ____ *Field demonstration*
- ____ *Pilot-scale treatability study*
- ____ *Bench-scale treatability study*
- ____ *RCRA Research, Development, and Demonstration*
- ____ *TSCA National Demonstration*
- ____ *TSCA Research and Development*
- ____ *EPA SITE Demonstration Program*
- ____ *EPA SITE Emerging Technology Program*
- ____ *Research*
- ____ *Other (specify)* _____

Media Treated *(Check all that apply)*

- ____ Soil (in situ)
- ____ Soil (ex situ)
- ____ Sludge
- ____ Solid
- ____ Natural sediment (in situ)
- ____ Natural sediment (ex situ)
- ____ Ground water in situ
- ____ Off-gas from a primary treatment technology
- ____ Dense nonaqueous phase liquids (DNAPL) [in situ]
- ____ Light nonaqueous phase liquids (LNAPL) [in situ]
- ____ Other: _____

Volume/Quantity Treated

_____ _____
(Units)

Area treated (for in situ projects)

_____ _____
(Units)

Depth treated (for in situ projects)

_____ _____
(Units)

Equipment Scale *(Check one only)*

- ____ Bench
- ____ Pilot
- ____ Full

Project Status

Contracted

Month ____ Year ____

In cleanup Yes ____ No

Completed

Month ____ Year ____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA (continued)

b. (continued)

Note: (1) List one specific contaminant per line. Do not list such entire contaminant groups as VOCs or solvents. TPH, which can be analyzed using a specific test method, can be listed as an individual contaminant.

(2) and (3) Indicate the appropriate units; for concentrations that were non-detect write N.D.; treated concentration should be lower than untreated concentration unless the technology is dewatering or some other volume reduction method. If a concentration range cannot be given, provide an average and note it as such.

(4) Specify the cleanup standard or goal, if known, for the individual contaminant for this project. For example, if the project was part of a Superfund remedial action, the cleanup goal is specified in the record of decision (ROD) for that site.

Performance Data

(1) Contaminant or Pollutant Parameter	(2) Untreated Concentration Range (Min to Max)	(3) Units	(2) Treated Concentration Range (Min to Max)	(3) Units	(4) Cleanup Standard or Goal	(3) Units
(Example) Benzene	50 - 150	mg/kg	25 - 50	mg/kg	50	mg/kg

Comments on Performance Data _____

Cost Information

Estimated or actual total and/or unit cost for this project

$ _____ per _____ (unit)

$ _____ (total)

What items or activities are included in these cost(s) (e.g., mobilization, demobilization, excavation, waste handling)?

_____

_____

_____

Person outside of company familiar with project (optional)

Name _____ **Company** _____

Address _____

_____

Phone _____

Is Literature Available on this Project? (You may wish to include these citations in *Part 6*)

___ **Yes** ___ **No**

Additional project information site conditions, mode of operation, and other pertinent information). _____

_____

_____

_____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA (continued)

c.

Site Name or Industry Type if Client Identity is Confidential: _____

Site Type or Waste Source (Check all that apply)

- ____ Agriculture
- ____ Battery recycling/disposal
- ____ Chloro-alkali manufacturing
- ____ Coal gasification
- ____ Dry cleaning
- ____ Electroplating
- ____ Gasoline service station/petroleum storage facility
- ____ Herbicide manufacturing/use
- ____ Industrial landfills
- ____ Inorganic/organic pigments
- ____ Machine shops
- ____ Metal ore mining and smelting
- ____ Municipal Landfill
- ____ Munitions Manufacturing
- ____ Paint/ink formulation
- ____ Pesticide manufacturing/use
- ____ Petroleum refining and reuse
- ____ Photographic products
- ____ Plastics manufacturing
- ____ Pulp and paper industry
- ____ Other organic chemical manufacturing
- ____ Other inorganic chemical manufacturing
- ____ Semiconductor manufacturing
- ____ Rubber manufacturing
- ____ Wood preserving
- ____ Uranium mining
- ____ Others *(specify)* _____

Location

City _____

State/Province: _____

Country _____

Project took place at site named

_____ Yes

_____ No

At another site (that is, a Test facility)

_____ Yes

_____ No

Regulation/Statute/Organization (Check all that apply)

- _____ *RCRA corrective action*
- _____ *CERCLA*
- _____ *TSCA*
- _____ *Safe Drinking Water Act*
- _____ *UST corrective action*
- _____ *State (specify)* _____
- _____ *DOD*
- _____ *DOE*
- _____ *Other (Specify)* _____
- _____ *Not Applicable*

Application or Project Type *(Check all that apply)*

- _____ *Full-scale cleanup*
- _____ *Field demonstration*
- _____ *Pilot-scale treatability study*
- _____ *Bench-scale treatability study*
- _____ *RCRA Research, Development, and Demonstration*
- _____ *TSCA National Demonstration*
- _____ *TSCA Research and Development*
- _____ *EPA SITE Demonstration Program*
- _____ *EPA SITE Emerging Technology Program*
- _____ *Research*
- _____ *Other (specify)* _____

Media Treated *(Check all that apply)*

- _____ Soil (in situ)
- _____ Soil (ex situ)
- _____ Sludge
- _____ Solid
- _____ Natural sediment (in situ)
- _____ Natural sediment (ex situ)
- _____ Ground water in situ
- _____ Off-gas from a primary treatment technology
- _____ Dense nonaqueous phase liquids (DNAPL) [in situ]
- _____ Light nonaqueous phase liquids (LNAPL) [in situ]
- _____ Other: _____

Volume/Quantity Treated

_____ _____ (Units)

Area treated (for in situ projects)

_____ _____ (Units)

Depth treated (for in situ projects)

_____ _____ (Units)

Equipment Scale *(Check one only)*

_____ Bench

_____ Pilot

_____ Full

Project Status

Contracted

Month _____ Year _____

In cleanup Yes ____ No ____

Completed

Month _____ Year _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA (continued)

c. (continued)

Note: (1) List one specific contaminant per line. Do not list such entire contaminant groups as VOCs or solvents. TPH, which can be analyzed using a specific test method, can be listed as an individual contaminant.

(2) and (3) Indicate the appropriate units; for concentrations that were non-detect write N.D.; treated concentration should be lower than untreated concentration unless the technology is dewatering or some other volume reduction method. If a concentration range cannot be given, provide an average and note it as such.

(4) Specify the cleanup standard or goal, if known, for the individual contaminant for this project. For example, if the project was part of a Superfund remedial action, the cleanup goal is specified in the record of decision (ROD) for that site.

Performance Data

(1) Contaminant or Pollutant Parameter	(2) Untreated Concentration Range (Min to Max)	(3) Units	(2) Treated Concentration Range (Min to Max)	(3) Units	(4) Cleanup Standard or Goal	(3) Units
(Example) Benzene	50 - 150	mg/kg	25 - 50	mg/kg	50	mg/kg

Comments on Performance Data _____

Cost Information

Estimated or actual total and/or unit cost for this project

$ _____ per _____ (unit)

$ _____ (total)

What items or activities are included in these cost(s) (e.g., mobilization, demobilization, excavation, waste handling)?

_____

_____

_____

Person outside of company familiar with project (optional)

Name _____ **Company** _____

Address _____

_____

Phone _____

Is Literature Available on this Project? (You may wish to include these citations in *Part 6*)

___ **Yes** ___ **No**

Additional project information site conditions, mode of operation, and other pertinent information). _____

_____

_____

_____

_____

Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA (continued)

d.

Site Name or Industry Type if Client Identity is Confidential: _____

Site Type or Waste Source (Check all that apply)

- ____ Agriculture
- ____ Battery recycling/disposal
- ____ Chloro-alkali manufacturing
- ____ Coal gasification
- ____ Dry cleaning
- ____ Electroplating
- ____ Gasoline service station/petroleum storage facility
- ____ Herbicide manufacturing/use
- ____ Industrial landfills
- ____ Inorganic/organic pigments
- ____ Machine shops
- ____ Metal ore mining and smelting
- ____ Municipal Landfill
- ____ Munitions Manufacturing
- ____ Paint/ink formulation
- ____ Pesticide manufacturing/use
- ____ Petroleum refining and reuse
- ____ Photographic products
- ____ Plastics manufacturing
- ____ Pulp and paper industry
- ____ Other organic chemical manufacturing
- ____ Other inorganic chemical manufacturing
- ____ Semiconductor manufacturing
- ____ Rubber manufacturing
- ____ Wood preserving
- ____ Uranium mining
- ____ Others *(specify)* _____

Location

City _____

State/Province: _____

Country _____

Project took place at site named

_____ Yes

_____ No

At another site (that is, a Test facility)

_____ Yes

_____ No

Regulation/Statute/Organization (Check all that apply)

- _____ *RCRA corrective action*
- _____ *CERCLA*
- _____ *TSCA*
- _____ *Safe Drinking Water Act*
- _____ *UST corrective action*
- _____ *State (specify)* _____
- _____ *DOD*
- _____ *DOE*
- _____ *Other (Specify)* _____
- _____ *Not Applicable*

Application or Project Type *(Check all that apply)*

- _____ *Full-scale cleanup*
- _____ *Field demonstration*
- _____ *Pilot-scale treatability study*
- _____ *Bench-scale treatability study*
- _____ *RCRA Research, Development, and Demonstration*
- _____ *TSCA National Demonstration*
- _____ *TSCA Research and Development*
- _____ *EPA SITE Demonstration Program*
- _____ *EPA SITE Emerging Technology Program*
- _____ *Research*
- _____ *Other (specify)* _____

Media Treated *(Check all that apply)*

- _____ Soil (in situ)
- _____ Soil (ex situ)
- _____ Sludge
- _____ Solid
- _____ Natural sediment (in situ)
- _____ Natural sediment (ex situ)
- _____ Ground water in situ
- _____ Off-gas from a primary treatment technology
- _____ Dense nonaqueous phase liquids (DNAPL) [in situ]
- _____ Light nonaqueous phase liquids (LNAPL) [in situ]
- _____ Other: _____

Volume/Quantity Treated

_____ _____ (Units)

Area treated (for in situ projects)

_____ _____ (Units)

Depth treated (for in situ projects)

_____ _____ (Units)

Equipment Scale *(Check one only)*

- _____ **Bench**
- _____ **Pilot**
- _____ **Full**

Project Status

Contracted

Month _____ Year _____

In cleanup Yes ____ No ____

Completed

Month _____ Year _____

Vendor Name _____

Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA (continued)

d. (continued)

Note: (1) List one specific contaminant per line. Do not list such entire contaminant groups as VOCs or solvents. TPH, which can be analyzed using a specific test method, can be listed as an individual contaminant.

(2) and (3) Indicate the appropriate units; for concentrations that were non-detect write N.D.; treated concentration should be lower than untreated concentration unless the technology is dewatering or some other volume reduction method. If a concentration range cannot be given, provide an average and note it as such.

(4) Specify the cleanup standard or goal, if known, for the individual contaminant for this project. For example, if the project was part of a Superfund remedial action, the cleanup goal is specified in the record of decision (ROD) for that site.

Performance Data

(1) Contaminant or Pollutant Parameter	(2) Untreated Concentration Range (Min to Max)	(3) Units	(2) Treated Concentration Range (Min to Max)	(3) Units	(4) Cleanup Standard or Goal	(3) Units
(Example) Benzene	50 - 150	mg/kg	25 - 50	mg/kg	50	mg/kg

Comments on Performance Data _____

Cost Information

Estimated or actual total and/or unit cost for this project

$ _____ per _____ (unit)

$ _____ (total)

What items or activities are included in these cost(s) (e.g., mobilization, demobilization, excavation, waste handling)?

_____

_____

_____

Person outside of company familiar with project (optional)

Name _____ **Company** _____

Address _____

_____

Phone _____

Is Literature Available on this Project? (You may wish to include these citations in *Part 6*)

___ **Yes** ___ **No**

Additional project information site conditions, mode of operation, and other pertinent information). _____

_____

_____

_____

Vendor Name _____

Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA (continued)

e.

Site Name or Industry Type if Client Identity is Confidential: _____

Site Type or Waste Source (Check all that apply)

- ____ Agriculture
- ____ Battery recycling/disposal
- ____ Chloro-alkali manufacturing
- ____ Coal gasification
- ____ Dry cleaning
- ____ Electroplating
- ____ Gasoline service station/petroleum storage facility
- ____ Herbicide manufacturing/use
- ____ Industrial landfills
- ____ Inorganic/organic pigments
- ____ Machine shops
- ____ Metal ore mining and smelting
- ____ Municipal Landfill
- ____ Munitions Manufacturing
- ____ Paint/ink formulation
- ____ Pesticide manufacturing/use
- ____ Petroleum refining and reuse
- ____ Photographic products
- ____ Plastics manufacturing
- ____ Pulp and paper industry
- ____ Other organic chemical manufacturing
- ____ Other inorganic chemical manufacturing
- ____ Semiconductor manufacturing
- ____ Rubber manufacturing
- ____ Wood preserving
- ____ Uranium mining
- ____ Others *(specify)* _____

Location

City _____

State/Province: _____

Country _____

Project took place at site named

_____ Yes

_____ No

At another site (that is, a Test facility)

_____ Yes

_____ No

Regulation/Statute/Organization (Check all that apply)

- _____ *RCRA corrective action*
- _____ *CERCLA*
- _____ *TSCA*
- _____ *Safe Drinking Water Act*
- _____ *UST corrective action*
- _____ *State (specify)* _____
- _____ *DOD*
- _____ *DOE*
- _____ *Other (Specify)* _____
- _____ *Not Applicable*

Application or Project Type *(Check all that apply)*

- _____ *Full-scale cleanup*
- _____ *Field demonstration*
- _____ *Pilot-scale treatability study*
- _____ *Bench-scale treatability study*
- _____ *RCRA Research, Development, and Demonstration*
- _____ *TSCA National Demonstration*
- _____ *TSCA Research and Development*
- _____ *EPA SITE Demonstration Program*
- _____ *EPA SITE Emerging Technology Program*
- _____ *Research*
- _____ *Other (specify)* _____

Media Treated *(Check all that apply)*

- _____ Soil (in situ)
- _____ Soil (ex situ)
- _____ Sludge
- _____ Solid
- _____ Natural sediment (in situ)
- _____ Natural sediment (ex situ)
- _____ Ground water in situ
- _____ Off-gas from a primary treatment technology
- _____ Dense nonaqueous phase liquids (DNAPL) [in situ]
- _____ Light nonaqueous phase liquids (LNAPL) [in situ]
- _____ Other: _____

Volume/Quantity Treated

_____ _____ (Units)

Area treated (for in situ projects)

_____ _____ (Units)

Depth treated (for in situ projects)

_____ _____ (Units)

Equipment Scale *(Check one only)*

_____ **Bench**

_____ **Pilot**

_____ **Full**

Project Status

Contracted

Month _____ Year _____

In cleanup Yes ____ No ____

Completed

Month _____ Year _____

Vendor Name _____

Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA (continued)

e. (continued)

Note: (1) List one specific contaminant per line. Do not list such entire contaminant groups as VOCs or solvents. TPH, which can be analyzed using a specific test method, can be listed as an individual contaminant.

(2) and (3) Indicate the appropriate units; for concentrations that were non-detect write N.D.; treated concentration should be lower than untreated concentration unless the technology is dewatering or some other volume reduction method. If a concentration range cannot be given, provide an average and note it as such.

(4) Specify the cleanup standard or goal, if known, for the individual contaminant for this project. For example, if the project was part of a Superfund remedial action, the cleanup goal is specified in the record of decision (ROD) for that site.

Performance Data

(1) Contaminant or Pollutant Parameter	(2) Untreated Concentration Range (Min to Max)	(3) Units	(2) Treated Concentration Range (Min to Max)	(3) Units	(4) Cleanup Standard or Goal	(3) Units
(Example) Benzene	50 - 150	mg/kg	25 - 50	mg/kg	50	mg/kg

Comments on Performance Data _____

Cost Information

Estimated or actual total and/or unit cost for this project

$ _____ per _____ (unit)

$ _____ (total)

What items or activities are included in these cost(s) (e.g., mobilization, demobilization, excavation, waste handling)?

_____

_____

_____

Person outside of company familiar with project (optional)

Name _____ **Company** _____

Address _____

_____

Phone _____

Is Literature Available on this Project? (You may wish to include these citations in *Part 6*)

___ **Yes** ___ **No**

Additional project information site conditions, mode of operation, and other pertinent information). _____

_____

_____

_____

Vendor Name _____

Technology Type _____

PART 6: LITERATURE AND TECHNICAL REFERENCES

42. List and attach available documentation (for example, journal articles, conference papers, patents) that best describes technology and vendor capabilities. References that contain performance and cost data are of particular interest. **Do not include personal references.** EPA reserves the right to add to the list other publicly available references.

Author(s) _____

Title _____

_____

Journal/Conference _____

Date _____ NTIS/EPA Document Number(s) _____

Author(s) _____

Title _____

_____

Journal/Conference _____

Date _____ NTIS/EPA Document Number(s) _____

Author(s) _____

Title _____

_____

Journal/Conference _____

Date _____ NTIS/EPA Document Number(s) _____

Author(s) _____

Title _____

_____

Journal/Conference _____

Date _____ NTIS/EPA Document Number(s) _____

Author(s) _____

Title _____

_____

Journal/Conference _____

Date _____ NTIS/EPA Document Number(s) _____

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APPENDIX A
BUSINESS CLASSIFICATION INFORMATION

The following information is intended to be used as a reference to answer question 2e. SIC code information and definitions are given below. To determine if your company is a small and/or disadvantaged business first identify the Standard Industrial Classification (SIC) code for your company and secondly identify whether or not your company qualifies as a small business under that SIC code. Small and disadvantaged businesses are defined below.

Definition of SIC Code

Standard Industrial Classification (SIC) Code - refers to the four-digit number assigned by the government to classify establishments by the type of activity in which they are engaged. The codes are published by the Government in the Standard Industrial Classification Manual. The Manual is intended to cover the entire field of economic activities. It classifies and defines activities by industry categories and is the source used by the Small Business Administration (SBA) as a guide in defining industries for size standards. The number of employees or annual receipts indicates the maximum allowed for a concern, including its affiliates, to be considered small (Federal Acquisition Circular (FAC) 90-16, December 21, 1992, Federal Acquisition Regulation (FAR), 19.102(g)).

Most remediation firms should fall under one of the SIC codes defined below:

The following SIC code definitions are taken from the Standard Industrial Classification Manual, 1987, Office of Management and Budget.

SIC code 4953: Refuse Systems (i.e., activities related to actual site cleanup) Establishments primarily engaged in the collection and disposal of refuse by processing or destruction or in the operation of incinerators, waste treatment plans, landfills, or other sites for disposal of such materials. Establishments primarily engaged in collecting and transporting refuse without such disposal are classified in Transportation, Industry 4212.

Acid waste, collection and disposal of
Ashes, collection and disposal of
Dumps, operation of
Garbage: collecting, destroying, and processing
Hazardous waste material disposal sites
Incinerator operation
Landfill, sanitary: operation of
Radioactive waste materials, disposal of
Refuse systems
Rubbish collection and disposal
Sludge disposal sites
Street refuse systems
Waste materials disposal at sea

SIC code 8711: Engineering Services (i.e., activities related to remedial investigations, feasibility studies, and remedial design) Establishments primarily engaged in providing professional engineering services. Establishments primarily providing and supervising their own engineering staff on temporary contract to other firms are included in this industry. Establishments providing engineering

personnel, but not general supervision, are classified in Industry 7363. Establishments primarily engaged in providing architectural engineering services are classified in Industry 8712, and those providing photogrammetric engineering services are classified in Industry 8713.

Designing: ship, boat, and machine	Machine tool designers
Engineering services: industrial, civil, electrical, mechanical, petroleum, marine, and design	Marine engineering services Petroleum engineering services

Definitions of Small and Disadvantaged/Minority Business

The following small business size standards established by the SBA are taken from FAC90-16 December 21, 1992, FAR 19.102.

SIC Code	Description	Size
4943	Refuse Systems	$6.0 million
8711	Engineering Services	
	Military and Aerospace Equipment and Military Weapons	$13.5 million
	Marine Engineering and Naval Architecture	$9.0 million
	Other Engineering Services	$2.5 million

The following information is taken from FAC 90-16 December 21, 1992, FAR 19.101.

Small business concern - means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on government contracts, and qualified as a small business under the criteria and size standards in 13 CFR Part 121. Such a concern is "not dominant in its field of operation" when it does not exercise a controlling or major influence on a national basis in a kind of business activity in which a number of business concerns are primarily engaged. In determining whether dominance exists, consideration shall be given to all appropriate factors, including volume of business, number of employees, financial resources, competitive status or position, ownership or control of materials, processes, patents, license agreements, facilities, sales territory, and nature of business activity.

Small disadvantaged/minority business concern - means a small business concern that is at least 51 percent unconditionally owned by one or more individuals who are both socially and economically disadvantaged, or a publicly owned business that has at least 51 percent of its stock unconditionally owned by one or more socially and economically disadvantaged individuals and that has its management and daily business controlled by one or more such individuals. This term also means a small business concern that is at least 51 percent unconditionally owned by an economically disadvantaged Indian tribe or Native Hawaiian Organization, or a publicly owned business that has at least 51 percent of its stock unconditionally owned by one of these entities, that has its management

and daily business controlled by members of an economically disadvantaged Indian tribe or Native Hawaiian Organization, and that meets the requirements of 13 CFR 124.

(a) "Socially disadvantaged individuals" means individuals who have been subjected to racial or ethnic prejudice or cultural bias because of their identify as a member of a group without regard to their qualities as individuals.

(b) "Economically disadvantaged individuals" means socially disadvantaged individuals whose ability to compete in the free enterprise system is impaired due to diminished opportunities to obtain capital and credit as compared to others in the same line of business who are not socially disadvantaged. Individuals who certify that they are members of named groups (Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Subcontinent-Asian Americans) are to be considered socially and economically disadvantaged.

(1) "Subcontinent Asian Americans" means United States citizens whose origins are in India, Pakistan, Bangladesh, Sri Lanka, Bhutan, or Nepal.

(2) "Asian Pacific Americans" means United States citizens whose origins are in Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, the U.S. Trust Territory of the Pacific Islands (Republic of Palau), the Northern Mariana Islands, Laos, Kampuchea (Cambodia), Taiwan, Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Republic of the Marshall Islands, or the Federated States of Micronesia.

(3) "Native Americans" means American Indians, Eskimos, Aleuts, and Native Hawaiians.

(c) "Native Hawaiian Organization" means any community service organization serving Native Hawaiians in, and chartered as a not-for-profit organization by, the State of Hawaii, which is controlled by Native Hawaiians, and whose business activities will principally benefit such Native Hawaiians.

(d) "Indian tribe" means any Indian tribe, band, nation, or other organized group or community of Indians, including any Alaska Native Corporation as defined in 13 CFR 124.100 which is recognized as eligible for the special programs and services provided by the U.S. to Indians because of their status as Indians, or which is recognized as such by the State in which such tribe, band, nation, group, or community resides.

Women-owned - as used in this form, means a business that is at least 51 percent owned by a woman or women who are U.S. citizens and who also control and operate the business.

APPENDIX B
KEY TO CONTAMINANT GROUPS

CONTAMINANT GROUP CODES FOR HAZARDOUS SUBSTANCES LIST

Organic

- A Halogenated volatiles
- B Halogenated semivolatiles
- C Nonhalogenated volatiles
- D Nonhalogenated semivolatiles
- E Organic pesticides/herbicides
- F Dioxins/furans
- G PCBs
- H Polynuclear aromatics (PNAs)
- I Solvents
- J Benzene-toluene-ethylbenzene-xylene (BTEX)
- K Organic cyanide
- L Organic corrosives

Inorganic

- M Heavy metals
- N Nonmetallic toxic elements (As, F)
- O Radioactive metals
- P Asbestos
- Q Inorganic cyanides
- R Inorganic corrosives

Miscellaneous

- S Explosives/propellants
- T Organometallic pesticides/herbicides

Organic Contaminant Group

CAS No.		
208968	Acenaphthylene	D,H
83329	Acenaphthene	D,H
75070	Acetaldehyde	C
67641	Acetone	C,I
75058	Acetonitrile	C,K
98862	Acetophenone	D
591082	Acetyl-2-thiourea, 1	D
107028	Acrolein	C
79061	Acrylamide	D
79107	Acrylic acid	CL
107131	Acrylonitrile	C
124049	Adipic acid	L
116063	Aldicarb	E
309002	Aldrin	E
107186	Allyl alcohol	E
62533	Aniline	D,I,L
120127	Anthracene	D,H
1912249	Atrazine	E
2642719	Azinphos-ethyl	E
86500	Azinphos-methyl	E
151564	Aziridine	C
71432	Benzene	C,I,J
98884	Benzene carbonyl chloride	B
92875	Benzidine	D
205992	Benzofluoranthene,3,4-	H
65850	Benzoic acid	D,L
100470	Benzonitrile	C,I
95169	Benzothiazole,1,2-	D,I
50328	Benzo (a) pyrene	D,H
206440	Benzo (j,k) fluorene	H
207089	Benzo (k) fluoranthene	D,H
100447	Benzyl chloride	A
56553	Benz (a) anthracene	D,H
117817	Bis (2-ethyl hexyl) phthalate	D
111911	Bis (2-chloroethoxy) methane	B
111444	Bis (2-chloroethyl) ether	B
542881	Bis (chloromethyl) ether	B
75274	Bromodichloromethane	A
74964	Bromomethane	A
1689845	Bromoxynil	E
106990	Butadiene, 1,3-	C
71363	Butanol	C
85687	Butlbenzyl phthalate	D
94826	Butyric acid, 4-2(2,4-dichlorop)	C,L

CAS No.		
133062	Captan	B
63252	Carbaryl	E
1563662	Carbofuran	E,F
75150	Carbon disulfide	C
56235	Carbon tetrachloride	A
78196	Carbophenothion	E
75876	Chloral	A
57749	Chlordane	E
106478	Chloroaniline, p-	B
108907	Chlorobenzene	A
67663	Chloroform	A
74873	Chloromethane	A
107302	Chloromethyl methyl ether	A
106898	Chloromethyloxirane, 2-	E
91587	Chloronaphthalene, 2-	B
95578	Chlorophenol, 2-	B
59507	Chloro-3-methylphenol, 4-	B
2921882	Chloropyrifos	E
218019	Chrysene	D,H
56724	Coumaphos	E
8021394	Creosote	H
108394	Cresol, m-	D
106445	Cresol, p-	D
98828	Cumene	C,I
21725462	Cyanazine	E
110827	Cyclohexane	C,I
108941	Cyclohexanone	C
72548	DDD	E
72559	DDE	E
50293	DDT	E
78488	DEF	C,E
333415	Diazinon	E
132649	Dibenzofuran	D
53703	Dibenz (a,h) anthracene	D,H
124481	Dibromachloromethane	A
106934	Dibromoethane, 1,2-	A
96128	Dibromo-3-chloropropane, 1,2-	A
1918009	Dicamba	E
95501	Dichlorobenzene, 1,2-	B
541731	Dichlorobenzene, 1,3-	B
106467	Dichlorobenzene, 1,4-	B
91941	Dichlorobenzidine, 3,3-	B
75718	Dichlorodifluoromethane	A
75343	Dichloroethane, 1,1-	A

CAS No.		
107062	Dichloroethane, 1,2-	A
75354	Dichloroethene, 1,1-	A
156592	Dichloroethylene, cis-1,2-	A
156605	Dichloroethylene, trans-1,2-	A
120832	Dichlorophenol, 2,4-	B
94757	Dichlorophenoxyacetic acid, 2-	L
78875	Dichloropropane, 1,2-	A
542756	Dichloropropene, 1,3-	A
62737	Dichlorvos	E
115322	Dicofol	E
60571	Dieldrin	E
84662	Diethyl phthalate	D
111466	Diethylene glycol	D,I
1660942	Diisopropylmethylphosphonate	D
60515	Dimethoate	E
119904	Dimethoxybenzidine, 3,3-	D
105679	Dimethyl phenol, 2,4-	D
13113	Dimethyl phthalate	D
77781	Dimethyl sulfate	C
99650	Dinitrobenzene, 1,3-	D
51285	Dinitrophenol, 2,4-	D
121142	Dinitrotoluene, 2,4-	D
606202	Dinitrotoluene, 2,6-	D
88857	Dinoseb	E
123911	Dioxane, 1,4	C
78342	Dioxathion	E
122667	Diphenylhydrazine, 1,2-	D,H
85007	Diquat	E
298044	Disulfoton	C,E
330541	Diuron	E
84742	Di-n-butyl phthalate	D
117840	Di-n-octyl phthalate	D
115297	Endosulfan	E
959988	Endosulfan	I
33212659	Endosulfan II	E
1031078	Endolsulfan sulfate	E
145733	Endothall	E
72208	Endrin	E
7421934	Endrin aldehyde	E
563122	Ethion	E
141786	Ethyl acetate	C
100414	Ethyl benzene	C,J
75003	Ethyl chloride	A,I
60297	Ethyl ether	C
107211	Ethylene glycol	I
110805	Ethylene glycol monoethyl ether	C,I
759944	Ethylpropylthio carbomate, S-	E

CAS No.		
122145	Fenitrothion	E
86737	Fluorene	D,H
50000	Formaldehyde	C
64186	Formic acid	L
110009	Furan	F
98011	Furfural	I,C
765344	Glycidyaldehyde	G
76448	Heptachlor	E
1024573	Heptachlor epoxide	E
118741	Hexachlorobenzene	B
87683	Hexachlorobutadieene	B
60873	Hexachlorocyclohexane, alpha-	E
60873	Hexachlorocyclohexane, beta-	E
60873	Hexachlorocyclohexane, delta-	E
77474	Hexachlorocyclopentadiene	B
67721	Hexachloroethane	B
70304	Hexachlorophene	B
110543	Hexane	C,I
1689834	Ioxynil	E
78831	Isobutanol	C
78591	Isophorone	D
143500	Kepone	E
58899	Lindane	E
121755	Malathion	C,E
108316	Maleic anhydride	E
123331	Maleric hydrazide	E
126987	Methacrylonitrile	C
67561	Methanol	C
16752775	Methomyl	E
72435	Methoxychlor	E
79221	Methyl chlorocarbonate	L
78933	Methyl ethyl ketone	C
108101	Methyl isobutyl ketone	C,I
80626	Methyl methacrylate	C
101144	Methylene bis (2-chloroaniline)	B
75092	Methylene chloride	A
23855	Mirex	E
91203	Naphthalene	D,H
100016	Nitroaniline, p-	D
98953	Nitrobenzene	D
100027	Nitrophenol, 4-	D

Organic Contaminant Group (continued)

CAS No.		
1116547	Nitrosodiethanolamine, n-	D
55185	Nitrosodiethylamine, n-	D
62759	Nitrosodimethylamine, n-	D
86306	Nitrosodiphenylamine, n-	D
930552	Nitrosopyrrolidine, n-	D
924163	Nitroso-di-n-butylamine, n-	D
615532	Nitroso-di-n-methylurethane, n-	D
99990	Nitrotoluene, 4-	D
56382	Parathion, ethyl-	E
298000	Parathion, methyl-	E
1336363	PCBs	G
608935	Pentachlorobenzene	B
76017	Pentachloroethane	B
82688	Pentachloronitrobenzene	B
87865	Pentachlorophenol	B
85018	Phenanthrene	D,H
108952	Phenol	D
139662	Phenyl sulfide	D
62384	Phenylmercurie acetate	E
298022	Phorate	C,E
75445	Phosgene	E
13171216	Phosphamidon	E
7803512	Phosphine	E
85449	Phthalic anhydride	D,E
23950585	Pronamide	D
129000	Pyrene	D,H
110861	Pyridine	C,I
91225	Quinoline	D,H
108463	Resorcinol	D
299843	Ronnel	E
57249	Strychnine	E,H
100425	Styrene	C

CAS No.		
746016	TCDD	F
95943	Tetrachlorobenzene, 1,2,4,5-	B
630206	Tetrachloroethane, 1,1,1,2-	A,E,I
79345	Tetrachloroethane, 1,1,2,2-	A
127184	Tetrachloroethene	A
58902	Tetrachlorophenol, 2,3,4,6	B
3689245	Tetraethyldithiopyrophosphate	E
109999	Tetrahydrofuran	F,I
137268	Thiram	E
108883	Toluene	C,J
584849	Toluene diisocyanate	D
8001352	Toxaphene	E
93721	TP, 2,4,5-	E
75252	Tribromomethane	A
120821	Trichlorobenzene, 1,2,4-	B
71556	Trichloroethane, 1,1,1-	A
79005	Trichloroethane, 1,1,2-	A
79016	Trichloroethylene	A
75694	Trichlorofluoromethane	A
933788	Trichlorophenol, 2,3,5-	B
95954	Trichlorophenol, 2,4,5-	B
88062	Trichlorophenol, 2,4,6-	B
609198	Trichlorophenol, 3,4,5-	B
93765	Trichlorophenoxyacetic acid, 2-	L
933788	Trichloro-1,2,2-trifluoroethane	A,I
27323417	Triethanolamine	E
126727	Tris (2,3-dibromopropyl) phosphate	B
108054	Vinyl acetate	C
75014	Vinyl chloride	A
81812	Warfarin	E
108383	Xylene, m-	C,J
95476	Xylene, o-	C,J
106423	Xylene, p-	C,J

Inorganic Contaminant Group

CAS No.		
7429905	Aluminum	M
20859738	Aluminum phosphide	M
7440360	Antimony	M
7440382	Arsenic	M
1327533	Arsenic trioxide	M
1303339	Arsenic trisulfide	M
7440393	Barium	M
542621	Barium cyanide	M,Q
7440417	Beryllium	M
7440439	Cadmium	M
13765190	Calcium chromate	M
7778543	Calcium hypochlorite	M
1333820	Chromic acid	M,R
7440473	Chromium	M
	Chromium (III)	M
	Chromium (VI)	M
7440484	Cobalt	M
7440508	Copper	M
544923	Copper cyanide	M,Q
7720787	Ferrous sulfate	M
7439896	Iron	M
7439921	Lead	M
7439965	Manganese	M
7439976	Mercury	M
7440020	Nickel	M
7718549	Nickel chloride	M
10102440	Nitrogen dioxide	R
7789006	Potassium chromate	M
151508	Potassium cyanide	M,Q
506616	Potassium silver cyanide	M,Q
7783008	Selenious acid	M,R
7782492	Selenium	M
7440224	Silver	M
506649	Silver cyanide	M,Q
7440235	Sodium	M
26628228	Sodium azide	M
7681494	Sodium fluoride	M
7775113	Sodium chromate	M
143339	Sodium cyanide	M,Q
1310732	Sodium hydroxide	M,R
7440280	Thallium	M
1314325	Thallic oxide	M
563688	Thallium acetate	M
6533739	Thallium carbonate	M
7791120	Thallium chloride	M
10102451	Thallium nitrate	M
12039520	Thallium selenide	M
7446186	Thallium (I) sulfate	M
7440291	Thorium	M
1314621	Vanadium pentoxide	M
7440666	Zinc	M
557211	Zinc cyanide	M,Q
1314847	Zinc phosphide	M
7733020	Zinc sulfate	M

Explosive/Propellants

CAS No.		
7664417	Ammonia	S
131748	Ammonium picrate	S
7773060	Ammonium sulfamate	S
460195	Cyanogen	S
2691410	Cyclotetramethylenetetranitramine	S
302012	Hydrazine	S
55630	Nitroglycerine	S
99990	Nitrotoluene, 4-	S
26628228	Sodium azide	M,S
99354	Trinitrobenzene, 1,3,5	S
118967	Trinitrotoluene	S

Organometallic Compound

CAS No.		
630104	Selenourea	U
78002	Tetraethyl lead	U

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Appendix C
List of VISITT 4.0 Vendors by Technology

ACID EXTRACTION
- ADVANCED RECOVERY SYSTEMS, INC.
- CENTER FOR HAZARDOUS MATERIALS RESEARCH
- COGNIS, INC.
- COGNIS, INC.
- EARTH TREATMENT TECHNOLOGIES, INC.
- IT CORPORATION
- LOCKHEED CORPORATION

ADSORPTION/ABSORPTION - IN SITU
- DYNAPHORE, INC.
- ENVIRONMENTAL FUEL SYSTEMS, INC.

AIR SPARGING
- BILLINGS & ASSOCIATES, INC.
- ENVIROGEN, INC.
- HAYWARD BAKER ENVIRONMENTAL, INC.
- HORIZONTAL TECHNOLOGIES, INC.
- IEG TECHNOLOGIES CORP.
- IT CORPORATION
- QUATERNARY INVESTIGATIONS, INC.
- TERRA VAC, INC.

BIOREMEDIATION - IN SITU GROUNDWATER
- ABB ENVIRONMENTAL SERVICES, INC.
- BIO-GENESIS TECHNOLOGIES
- ECOLOGY TECHNOLOGIES INTERNATIONAL, INC.
- ECOTECHNIEK B.V.
- ELECTROKINETICS, INC.
- ENSR CONSULTING AND ENGINEERING
- EODT SERVICES, INC.
- ESE ENVIRONMENTAL, INC.
- GAIA RESOURCE, INC.
- GEO-MICROBIAL TECHNOLOGIES, INC.
- GROUNDWATER TECHNOLOGY, INC.
- IT CORPORATION
- KEMRON ENVIRONMENTAL SERVICES, INC.
- MICRO-BAC INTERNATIONAL, INC.
- MICROBIAL ENVIRONMENTAL SERVICES (MES)
- OHM REMEDIATION SERVICES CORPORATION
- REMEDIATION TECHNOLOGIES, INC.
- SBP TECHNOLOGIES, INC.
- WASTE STREAM TECHNOLOGY, INC.
- YELLOWSTONE ENVIRONMENTAL SCIENCE, INC.

BIOREMEDIATION - IN SITU LAGOON
- BIO-GENESIS TECHNOLOGIES
- ECOLOGY TECHNOLOGIES INTERNATIONAL, INC.
- LIMNOFIX INC./GOLDER ASSOCIATES
- OHM REMEDIATION SERVICES CORPORATION
- PRAXAIR, INC.

BIOREMEDIATION - IN SITU SOIL
- ABB ENVIRONMENTAL SERVICES, INC.
- BILLINGS & ASSOCIATES, INC.
- BIO-GENESIS TECHNOLOGIES
- BIOGEE INTERNATIONAL, INC.
- DETOX INDUSTRIES, INC.
- ECOLOGY TECHNOLOGIES INTERNATIONAL, INC.
- ELECTROKINETICS, INC.
- ESE ENVIRONMENTAL, INC.
- GEO-MICROBIAL TECHNOLOGIES, INC.
- GRACE DEARBORN, INC.
- GROUNDWATER TECHNOLOGY, INC.
- HAYWARD BAKER ENVIRONMENTAL, INC.
- IN-SITU FIXATION, INC.
- KEMRON ENVIRONMENTAL SERVICES, INC.
- MICRO-BAC INTERNATIONAL, INC.
- MICROBIAL ENVIRONMENTAL SERVICES (MES)
- QUATERNARY INVESTIGATIONS, INC.
- SBP TECHNOLOGIES, INC.
- WASTE STREAM TECHNOLOGY, INC.

BIOREMEDIATION - NOT OTHERWISE SPECIFIED
- AP TECHNOLOGIES, INC.
- B&S RESEARCH, INC.
- BEAREHAVEN RECLAMATION, INC.
- BIO-PRO CORP.
- BIOREMEDIATION SERVICE, INC.
- BIOREMEDIATION TECHNOLOGY SERVICES, INC.
- CHEMPETE, INC.
- CLYDE ENGINEERING SERVICE
- DETOX INDUSTRIES, INC.
- ECO-TEC, INC./ECOLOGY TECHNOLOGY
- ENSITE, INC.
- EPG BIOSERVICES INC.
- ETUS, INC.
- MICHIGAN BIOTECHNOLOGY INSTITUTE
- PERINO TECHNICAL SERVICES, INC.
- SYBRON CHEMICALS, INC.

BIOREMEDIATION - SLURRY PHASE
- BIO SOLUTIONS, INC.
- BIO-GENESIS TECHNOLOGIES
- BIOGEE INTERNATIONAL, INC.
- BOGART ENVIRONMENTAL SERVICES, INC.
- ECOLOGY TECHNOLOGIES INTERNATIONAL, INC.
- EIMCO PROCESS EQUIPMENT CO.
- EODT SERVICES, INC.
- GENESIS ECO SYSTEMS, INC.
- GEO-MICROBIAL TECHNOLOGIES, INC.
- IT CORPORATION
- J.R. SIMPLOT COMPANY
- OHM REMEDIATION SERVICES CORPORATION
- PRAXAIR, INC.
- REMEDIATION TECHNOLOGIES, INC.
- SBP TECHNOLOGIES, INC.
- WASTE STREAM TECHNOLOGY, INC.
- YELLOWSTONE ENVIRONMENTAL SCIENCE, INC.
- YELLOWSTONE ENVIRONMENTAL SCIENCE, INC.

BIOREMEDIATION - SOLID PHASE
- ABB ENVIRONMENTAL SERVICES, INC.
- ABB ENVIRONMENTAL SERVICES, INC.
- ABB ENVIRONMENTAL SERVICES, INC.
- ALVAREZ BROTHERS, INC.
- ARCTECH, INC.
- BIO-GENESIS TECHNOLOGIES
- BIOGEE INTERNATIONAL, INC.
- BIOREMEDIATION SERVICE, INC.
- BIOREMEDIATION SERVICE, INC.
- CLEAN-UP TECHNOLOGY, INC.

EARTH TECH
EARTHFAX ENGINEERING, INC.
ECOLOGY TECHNOLOGIES INTERNATIONAL, INC.
ENSR CONSULTING AND ENGINEERING
ETUS, INC.
GEO-MICROBIAL TECHNOLOGIES, INC.
GRACE DEARBORN, INC.
GROUNDWATER TECHNOLOGY, INC.
IT CORPORATION
MICROBIAL ENVIRONMENTAL SERVICES (MES)
MYCOTECH CORPORATION
OHM REMEDIATION SERVICES CORPORATION
PERINO TECHNICAL SERVICES, INC.
REMEDIATION TECHNOLOGIES, INC.
SBP TECHNOLOGIES. INC.
WASTE STREAM TECHNOLOGY, INC.

BIOVENTING
ABB ENVIRONMENTAL SERVICES, INC.
BATTELLE PACIFIC NORTHWEST LABORATORIES
DAMES & MOORE
ENGINEERING-SCIENCE, INC.
ENSR CONSULTING AND ENGINEERING
ENVIROGEN, INC.
ENVIRONEERING
H2O SCIENCE, INC.
HAYWARD BAKER ENVIRONMENTAL, INC.
IT CORPORATION
MITTELHAUSER CORPORATION
OHM REMEDIATION SERVICES CORPORATION
QUATERNARY INVESTIGATIONS, INC.
TERRA VAC, INC.

CHEMICAL TREATMENT - DECHLORINATION
COMMODORE ENVIRONMENTAL SERVICES, INC.
SDTX TECHNOLOGIES, INC.

CHEMICAL TREATMENT - IN SITU GROUNDWATER
ENVIROMETAL TECHNOLOGIES, INC.
GEOCHEM DIVISION OF TERRA VAC
INTERA, INC.

CHEMICAL TREATMENT - OTHER
CLEANTECH OF ARKANSAS, INC.
CORPEX TECHNOLOGIES, INC.
DAVY INTERNATIONAL - ENVIRONMENTAL DIV.
INTEGRATED CHEMISTRIES, INC.
RMT, INC.
SOLUCORP INDUSTRIES LTD.
VIKING INDUSTRIES

CHEMICAL TREATMENT - OXIDATION/REDUCTION
ADVANCED RECOVERY SYSTEMS, INC.
ARCTECH, INC.
ARCTECH, INC.
DELPHI RESEARCH, INC.
ELI ECO LOGIC INTERNATIONAL, INC.
EM&C ENGINEERING ASSOCIATES
ETUS, INC.
G.E.M., INC.
HIGH VOLTAGE ENVIRONMENTAL APPLICATIONS
IT CORPORATION
IT CORPORATION
MOLTEN METAL TECHNOLOGY, INC.
SYNTHETICA TECHNOLOGIES, INC.
TERRA VAC, INC.
THERMOCHEM, INC.

DELIVERY/EXTRACTION SYSTEMS
DRILEX SYSTEMS, INC.
EASTMAN CHERRINGTON ENVIRONMENTAL
HORIZONTAL TECHNOLOGIES, INC.
NOVATERRA, INC.

DUAL PHASE EXTRACTION
BILLINGS & ASSOCIATES, INC.
DAMES & MOORE
EG & G ENVIRONMENTAL, INC.
FIRST ENVIRONMENT, INC.
IT CORPORATION
TERRA VAC, INC.

ELECTRICAL SEPARATION
ELECTRO-PETROLEUM, INC.
ELECTROKINETICS, INC.
WATER AND SLURRY PURIFICATION PROCESS

ELECTRO-THERMAL GASIFICATION - IN SITU
BIO-ELECTRICS, INC.

MAGNETIC SEPARATION
S.G. FRANTZ CO., INC.

MATERIALS HANDLING/PHYSICAL SEPARATION
CANONIE ENVIRONMENTAL SERVICES CORP.
MICROFLUIDICS CORP.
ONSITE * OFSITE INC./BATTELLE PNL
PORTEC, INC.
RECRA ENVIRONMENTAL, INC.

OFF-GAS TREATMENT
BECO ENGINEERING CO.
BOHN BIOFILTER CORP.
ECOLOGY TECHNOLOGIES INTERNATIONAL, INC.
ENVIROGEN, INC.
GENERAL ATOMICS
IT CORPORATION
KSE, INC.
MEMBRANE TECHNOLOGY & RESEARCH, INC.
MICHIGAN BIOTECHNOLOGY INSTITUTE
NUCON INTERNATIONAL, INC.
PROCESS TECHNOLOGIES, INC.
PRODUCT CONTROL
PURUS, INC.
THERMATRIX, INC.
ZAPIT TECHNOLOGY, INC.

PNEUMATIC FRACTURING
ACCUTECH REMEDIAL SYSTEMS, INC.
TERRA VAC, INC.

PYROLYSIS
BIO-ELECTRICS, INC.
ENERGY RECLAMATION, INC.
PLASMA ENERGY APPLIED TECHNOLOGY (PEAT)
PRODUCT CONTROL
VANCE IDS, INC.

SLAGGING
HORSEHEAD RESOURCE DEVELOPMENT CO., INC.
TEXACO, INC.

SOIL FLUSHING - IN SITU
HORIZONTAL TECHNOLOGIES, INC.

SOIL VAPOR EXTRACTION
DAMES & MOORE
DOW ENVIRONMENTAL, INC.

ENVIROGEN, INC.
GEO-CON, INC.
IT CORPORATION
KAP & SEPA, LTD.
QUATERNARY INVESTIGATIONS, INC.
TERRA VAC, INC.

SOIL WASHING

ADVANCED RECOVERY SYSTEMS, INC.
AEA TECHNOLOGY
ALTERNATIVE REMEDIAL TECHNOLOGIES, INC.
B&W NUCLEAR ENVIRONMENTAL SERVICES, INC.
BENCHEM
BERGMANN USA
BIOTROL, INC.
CANONIE ENVIRONMENTAL SERVICES CORP.
DIVESCO, INC.
EARTH DECONTAMINATORS, INC. (EDI)
ENSR CONSULTING AND ENGINEERING
GENESIS ECO SYSTEMS, INC.
GEOCHEM DIVISION OF TERRA VAC
GEOCYCLE ENVIRONNEMENT, INC.
HYDRIPLEX, INC.
KINIT ENTERPRISES
LOCKHEED CORPORATION
OHM REMEDIATION SERVICES CORPORATION
ON-SITE TECHNOLOGIES, INC.
SANFORD COHEN AND ASSOCIATES, INC.
SOIL TECHNOLOGY, INC.
TECHNOLOGY SCIENTIFIC, LTD.
TUBOSCOPE VETCO ENVIRONMENTAL SERVICES
WESTINGHOUSE REMEDIATION SERVICES, INC.

SOLVENT EXTRACTION

A/S PHOENIX CONTRACTORS/PHOENIX MILJOE
ART INTERNATIONAL, INC.
CF SYSTEMS CORPORATION
DEHYDRO-TECH CORPORATION
EM&C ENGINEERING ASSOCIATES
ENSR CONSULTING AND ENGINEERING
ENVIROGEN, INC.
GEO-MICROBIAL TECHNOLOGIES, INC.
INTEGRATED CHEMISTRIES, INC.
NATIONAL RESEARCH COUNCIL OF CANADA
RESOURCES CONSERVATION CO.
SRE, INC.
TERRA-KLEEN RESPONSE GROUP, INC.

SURFACTANT ENHANCED RECOVERY - IN SITU

ECOSITE, INC.
S.S. PAPADOPULOS & ASSOCIATES, INC.
SURTEK, INC.

THERMAL DESORPTION

ADVANCED ENVIRONMENTAL SERVICES, INC.
ADVANCED SOIL TECHNOLOGIES
ARIEL INDUSTRIES, INC.
BIRD ENVIRONMENTAL GULF COAST, INC.
CANONIE ENVIRONMENTAL SERVICES CORP.
CARLO ENVIRONMENTAL TECHNOLOGIES, INC.
CARSON ENVIRONMENTAL
CASWAN ENVIRONMENTAL SERVICES LTD.
CLEAN-UP TECHNOLOGY, INC.
CONTAMINATION TECHNOLOGIES, INC.
CONTECK ENVIRONMENTAL SERVICES, INC.
COVENANT ENVIRONMENTAL TECHNOLOGIES, INC.
DBA, INC.
ECOTECHNIEK B.V.
ENVIRO-KLEAN SOILS, INC.
ENVIRO-SOIL REMEDIATION, INC.
HAZEN RESEARCH, INC.
HRUBETZ ENVIRONMENTAL SERVICES, INC.
IT CORPORATION
IT CORPORATION
KALKASKA CONSTRUCTION SERVICE, INC.
MAXYMILLIAN TECHNOLOGIES, INC.
MERCURY RECOVERY SERVICES, INC.
MIDWEST SOIL REMEDIATION, INC.
O'BRIEN & GERE TECHNICAL SERVICES, INC.
PET-CON SOIL REMEDIATION, INC.
PHILIP ENVIRONMENTAL SERVICES CORP.
PRODUCT CONTROL
RECYCLING SCIENCE INTERNATIONAL, INC.
REMEDIATION TECHNOLOGIES, INC.
REMTECH, INC.
ROY F. WESTON, INC.
RUST INTERNATIONAL, INC.
SEAVIEW THERMAL SYSTEMS
SEPARATION AND RECOVERY SYSTEMS, INC.
SOIL REMEDIATION OF PHILADELPHIA, INC.
SOILTECH ATP SYSTEMS, INC.
SOUTHWEST SOIL REMEDIATION, INC.
SPI/ASTEC
TEXAROME, INC.
THERMOTECH SYSTEMS CORPORATION
TPS TECHNOLOGIES, INC.
WESTERN RESEARCH INSTITUTE
WESTINGHOUSE REMEDIATION SERVICES, INC.

THERMALLY ENHANCED RECOVERY - IN SITU

BATTELLE PACIFIC NORTHWEST LABORATORIES
BIO-ELECTRICS, INC.
EM&C ENGINEERING ASSOCIATES
EM&C ENGINEERING ASSOCIATES
HRUBETZ ENVIRONMENTAL SERVICES, INC.
IIT RESEARCH INSTITUTE
KAI TECHNOLOGIES, INC.
NOVATERRA, INC.
PRAXIS ENVIRONMENTAL TECHNOLOGIES, INC.
R.E. WRIGHT ENVIRONMENTAL, INC. (REWEI)
SIVE SERVICES
THERMATRIX, INC.

VITRIFICATION

B&W NUCLEAR ENVIRONMENTAL SERVICES, INC.
BATTELLE PACIFIC NORTHWEST LABORATORIES
BIO-ELECTRICS, INC.
ECOTECHNIEK B.V.
EET CORPORATION
ELECTRO-PYROLYSIS, INC.
EM&C ENGINEERING ASSOCIATES
GEOSAFE CORPORATION
MULTIPLEX XTALTITE-TEXILLA ENVIRONMENTAL
RETECH, DIV. OF LOCKHEED ENV. SYS.&TECH.
SEILER POLLUTION CONTROL SYSTEMS, INC.
STIR-MELTER, INC.(SUBSID/GLASSTECH,INC.)
VORTEC CORPORATION
WASTE DESTRUCTION TECHNOLOGIES, INC.